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# On the meaning and measurement of maximization

Nathan N. Cheek\*

Barry Schwartz†

## Abstract

Building on Herbert Simon's critique of rational choice theory, Schwartz et al. (2002) proposed that when making choices, some individuals — *maximizers* — search extensively through many alternatives with the goal of making the best choice, whereas others — *satisficers* — search only until they identify an option that meets their standards, which they then choose. They developed the Maximization Scale (MS) to measure individual differences in maximization, and a substantial amount of research has now examined maximization using the MS, painting a picture of maximizers that is generally negative. Recently, however, several researchers have criticized the MS, and almost a dozen new measures of maximization have now been published, resulting in a befuddling and contradictory literature. We seek to clarify the confusing literature on the measurement of maximization to help make sense of the existing findings and to facilitate future research. We begin by briefly summarizing the understanding of maximizers that has emerged through research using Schwartz et al.'s MS. We then review the literature on the measurement of maximization, attempting to identify the similarities and differences among the 11 published measures of maximization. Next, we propose a two-component model of maximization, outlining our view of how maximization should be conceptualized and measured. Our model posits that maximization is best understood as the pursuit of the maximization *goal* of choosing the best option through the maximization *strategy* of alternative search; other constructs such as decision difficulty and regret are best considered outcomes or causes — rather than components — of maximization. We discuss the implications of our review and model for research on maximization, highlighting what we see as pressing unanswered questions and important directions for future investigations.

Keywords: maximizing, satisficing, choice, decision making, goals, strategies

## 1 Introduction

There is more choice in the world than ever before, and the modern explosion of choice can have both positive and negative consequences for consumers (e.g., Broniarczyk & Griffin, 2014; Chernev, Böckenholt, & Goodman, 2015; Iyengar & Lepper, 2000; Schwartz, 2000, 2004, 2010). For instance, having more choices can make people feel empowered and in control of their lives (e.g., Fischer & Boer, 2011; Langer & Rodin, 1976; Ryan & Deci, 2000) — indeed, people report feeling more free when they have more options to choose from (e.g., Reibstein, Youngblood & Fromkin, 1975). Yet having many choices can also be overwhelming, leading to choice paralysis (i.e., failure to make any choice; Iyengar & Lepper, 2000), and increasing regret, dissatisfaction, and unhappiness (e.g., Chernev et al., 2015; Schwartz, 2000, 2004). And this dark side of choice may be more salient for some individuals than for others, depending on a number of important factors such as their backgrounds,

goals, strategies, cognitive styles, traits, and more. One such individual difference that has attracted substantial attention from researchers in recent years is *maximization* — the goal of making the best choice (Schwartz et al., 2002).

Simon (1955, 1956, 1957) originally proposed a distinction between maximizing and satisficing in a critique of rational choice theory. He argued that because of inherent limits on people's information processing abilities, as well as the potentially limitless number of options from which to choose, people cannot actually make the best possible decision (i.e., maximize or optimize) in the way posited by economic theory. Rather, people *satisfice* — that is, find an option that successfully satisfies their decision goals and preferences:

... from the examination of the postulates of these economic models it appears probable that, however adaptive the behavior of organisms in learning and choice situations, this adaptiveness falls short of the ideal of "maximizing" postulated in economic theory. Evidently, organisms adapt well enough to "satisfice"; they do not, in general, "optimize"<sup>1</sup> (Simon, 1956, p. 129).

Thus, in Simon's view, people are satisficers who seek options that are "good enough", instead of maximizers who

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<sup>1</sup>Although some authors use "maximize" and "optimize" to refer to different concepts, we use the two terms interchangeably in this review.

seek the undeniably best option. Satisficers' standards of acceptability may be dynamic, such that, over time and with exposure to better choice options, they may increase gradually, leading to standards that approach maximization. According to Simon, however, the explicit goal of maximization is neither achievable nor sought by finite cognitive creatures like human beings.

Building on Simon's (1955, 1956, 1957) original work, Schwartz et al. (2002) proposed that individuals differ in their decision goals, such that some people are maximizers who strive to make the best choice, whereas others are satisficers who strive to make choices that meet their standards without necessarily being the best.<sup>2</sup> To explore individual differences in maximization, Schwartz et al. developed the Maximization Scale (MS), which has since been used in most maximization studies. Recently, however, several researchers have criticized the validity and reliability of the MS, and almost a dozen new measures of maximization have been published in the fourteen years since Schwartz et al.'s initial research. Each new measure carries with it a distinct conceptualization — implicit or explicit — of what it means to maximize, which has produced a befuddling literature with many competing views of maximization. The proliferation of measures and definitions of maximization makes it difficult to interpret and compare competing research findings, and future research may be hampered because researchers do not know which measure of maximization to use.

In the present review, we seek to clarify the confusing literature on the measurement of maximization to help make sense of the existing conflicting findings and to facilitate future research. We begin by briefly exploring the understanding of maximizers that has emerged through research using Schwartz et al.'s (2002) MS to establish the context in which newer maximization scales emerged. We then review the literature on the measurement of maximization, attempting to identify the similarities and differences among the 11 published measures of maximization. Next, we propose a two-component model of maximization with the goals of integrating the myriad of theories and of distinguishing between maximization and related constructs. Drawing on this model, we discuss which scales, in our opinion, should be used by future researchers to measure the two components of maximization. Finally, we discuss the implications of our review and model for research on maximization, highlighting what we see as pressing unanswered questions and important directions for future investigations. Our aim in this review is principally to provide conceptual clarification of what "maximization" should be understood to mean, because we believe that conceptual clarification is needed to

facilitate further fruitful empirical investigation.

## 2 Maximizing research using the Maximization Scale

A substantial amount of research has now examined maximization using Schwartz et al.'s (2002) MS, and the picture painted of maximizers is generally, though not always, quite negative. In this section, we attempt to provide an overview of previous research using the MS. Our goal is not to exhaustively review all existing research, but rather to provide a summary of current understandings of the differences between maximizers and satisficers.

As measured by the MS, maximizers tend to be more prone to regret (Besharat, Ladik & Carrillat, 2014; Bruine de Bruin, Dombrovski, Parker & Szanto, in press; Moyano-Díaz, Cornejo, Carreño & Muñoz, 2013; Parker, Bruine de Bruin & Fischhoff, 2007; Purvis, Howell & Iyer, 2011; Spunt, Rassin & Epstein, 2009; Schwartz et al., 2002), more perfectionistic (Bergman, Nyland & Burns, 2007; Chang et al., 2011; Dahling & Thomas, 2012; Schwartz et al., 2002), less optimistic (Schwartz et al., 2002), greedier (Seuntjens, Zeelenberg, van de Ven, & Breugelmans, 2015), and more neurotic (Purvis et al., 2011; Schwartz et al., 2002) than satisficers. Maximizers are also less open (Purvis et al., 2011), less happy (Larsen & McKibban, 2008; Polman, 2010; Purvis et al., 2011; Schwartz et al., 2002), lower in life satisfaction (Chang et al., 2011; Dahling & Thomas, 2012; Schwartz et al., 2002), more hopeless (Bruine de Bruin et al., in press), more present-focused (Besharat et al. 2014; Carrillat, Ladik & Legoux, 2011), more prone to procrastination (Osiurak et al., 2015), less well adjusted (Chang et al., 2011), and are more likely to engage in counterfactual thinking (Leach & Patall, 2013; Schwartz et al., 2002) and ruminate about the past (Paivandy, Bullock, Reardon & Kelly, 2008). Furthermore, relative to satisficers, maximizers have lower self-esteem (Osiurak et al., 2015; Schwartz et al., 2002) and are more at risk for depression (Bruine de Bruin et al., in press; Schwartz et al., 2002), attention deficit/hyperactivity disorder (Schepman, Weyandt, Schlect & Swentosky, 2012), and suicide (Bruine de Bruin et al., in press). Studies also suggest that older people are less likely to maximize than younger people (e.g., Purvis et al., 2011; Tanius, Wood, Hanoach & Rice, 2009) and that maximization is somewhat heritable (Simonson & Sela, 2011).

When making decisions, maximizers engage in more comparison of options (Schwartz et al., 2002), consider more options (Chowdury, Ratneshwar & Mohanty, 2009; Dar-Nimrod, Rawn, Lehman & Schwartz, 2009; Polman, 2010; Schwartz et al., 2002; Yang & Chiou, 2010), and expend more time and effort in the decision process (Misuraca & Teuscher, 2013; Polman, 2010; Schwartz et al., 2002) than satisficers. Unfortunately, this additional effort

<sup>2</sup>Research on maximization characterizes maximizing tendencies as a continuous individual difference variable, but, for the ease of discussion, we will use the terms "maximizers" and "satisficers" as if they are categorically distinct.

does not appear to bring additional rewards for maximizers, as maximizers are often less satisfied with their decisions (Chowdhury et al., 2009; Dahling & Thomas, 2012; Iyengar, Wells & Schwartz, 2006; Leach & Patall, 2013; Sparks, Ehrlinger & Eibach, 2012; Schwartz et al., 2002; though see Shiner, 2015), despite attempting to minimize the likelihood of regret (Schwartz et al., 2002) and sacrificing more resources to gain access to more choices (Dar-Nimrod et al., 2009). Maximizers also experience more negative affect and stress during the decision process (Chowdhury et al., 2009; Dar-Nimrod et al., 2009; Spunt et al., 2009) and often employ poor decision making strategies (Bruine de Bruin, Parker & Fischhoff, 2007; Parker et al., 2007). Indeed, it may be these decision strategies that lead to more regret and dissatisfaction, as greater comparison of different options and a preference for larger choice sets can undermine satisfaction with choices (Dar-Nimrod et al., 2009; Iyengar & Lepper, 2000; Schwartz, 2004; Yang & Chiou, 2010).

Maximizers may also experience more regret and unhappiness because they engage in more social comparison in general and more upward social comparison in particular. For instance, Schwartz et al. (2002) found that maximizers were more prone to upward social comparison than satisficers, and that upward social comparison predicted unhappiness and regret. Maximizers are also more sensitive to the effects of social comparison (Schwartz et al., 2002) and readily use social comparison information over other relevant information to judge the quality of their performance (Polman, 2010). Social comparison may undermine maximizers' happiness because they rely on external criteria to make their decisions, rather than relying on more personally-relevant information (Iyengar et al., 2006; Parker et al., 2007). Furthermore, even if their choices produce better outcomes than expected, maximizers are still regretful when other people's choices turn out better than their own, whereas satisficers are happy with unexpectedly good choice outcomes regardless of the outcomes of other people's decisions (Huang & Zeelenberg, 2012). In other words, social comparison heightens maximizers' susceptibility to regret. Recent research has also underlined the importance of impression management and social competition for maximizers — Lin (2015) showed that, unlike satisficers, maximizers change their choice patterns depending on whether their decisions are public or private, and Weaver, Daniloski, Schwarz and Cottone (2015) suggested that maximizers do not only want to *choose* the best; they want to *be* the best as well.

Interestingly, although maximizers often experience worse *subjective* decision outcomes, they often achieve better *objective* decision outcomes. For example, in a study of college seniors applying for jobs, Iyengar et al. (2006; see also Polman, 2010) found that maximizers had more success in their job hunts: the mean salary of maximizers was about \$7,500 higher than that of satisficers. The strategies maxi-

mizers use to attain better objective outcomes, however, are often the same strategies that undermine their satisfaction — by seeking out more options, comparing more among options, and dwelling more on options even after they have given them up, maximizers incur the negative consequences of choice overload (see, e.g., Dar-Nimrod et al., 2009; Iyengar & Lepper, 2000; Iyengar et al., 2006; Schwartz, 2004; Schwartz et al., 2002). Additionally, Polman (2010) demonstrated that maximizers achieve more outcomes in general, such that, although maximizers achieve more positive outcomes than satisficers, they also achieve more negative outcomes (see also Parker et al., 2007). For example, by applying for more jobs than satisficers, maximizers increase their odds of receiving both more rejections and more job offers. However, because negative outcomes have a greater influence on affect than positive outcomes (e.g., Rozin & Royzman, 2001; Tversky & Kahneman, 1991), maximizers end up unhappier than satisficers despite some objectively superior outcomes.

In some situations, maximizers may not experience more post-decision regret and dissatisfaction than satisficers. Shiner (2015), for instance, recently showed that, although maximizers are less satisfied than satisficers after making irreversible decisions, they are actually *more* satisfied than satisficers after reversible decisions, at least in the short term. Contextual factors may therefore also play an important role in determining maximizers' negative outcomes, an issue to which we return at the end of this review.

In sum, although maximizers may not always be less satisfied with decisions than satisficers and may actually do objectively better than satisficers in some cases, the general impression that emerges from previous research using the MS is that maximizers undermine their own well-being by constantly striving to make the best choice. The maximization literature, however, has recently experienced the rapid introduction of almost a dozen new measures of maximizing, many of which define and measure maximizing quite differently than Schwartz et al. (2002) did with the MS. As a result, researchers have called into question claims about the downside of maximizing, suggesting that, when defined differently, maximizing need not be maladaptive, and may even be adaptive. In the next section, we review and attempt to clarify the literature on the measurement of maximizing, with the goals of highlighting the shared and unique aspects of the many measures and making explicit the distinct definitions of maximizing they assume.

### 3 Definitions and measures of maximization

Many of the conceptualizations and measures of maximization that have emerged since Schwartz et al. (2002)'s initial paper define maximization quite differently than the MS. In

Table 1: Maximization conceptualizations and measures.

Authors	Scale	Factors/ components	Definition of maximization
Simon (1955)	-----	2	The desire to optimize choice, achieved by searching exhaustively through alternatives
Schwartz et al. (2002)	Maximization Scale (MS)	1	The desire to get only the best, with the tendency to search out and compare among alternatives and to find decisions stressful
Nenkov et al. (2008)	Short Form Maximization Scale (MS-S)	3	Three distinct factors: having high standards, seeking out and comparing among alternatives, and experiencing decision difficulty
Diab et al. (2008)	Maximizing Tendency Scale (MTS)	1	“the general tendency to pursue the identification of the optimal alternative” (p. 365)
Lai (2010)	Modified Maximizing Scale (MMS)	1	“hop[ing] to find the best possible solution by systematically comparing available alternatives” (p. 164)
Turner et al. (2012)	Maximization Inventory (MI)	3	Two distinct components: alternative search and decision difficulty. Also introduced satisficing as a distinct construct
Weinhardt et al. (2012)	Revised Short Form Maximization Scale (MS-S-R)	3	See Nenkov et al.
Weinhardt et al. (2012)	Revised Maximizing Tendency Scale (MTS-R)	3	Desiring the best option/having high standards
Mikkelsen & Pauley (2013)	Relational Maximization Scale (RMS)	1	Same as Schwartz et al., but within the domain of romantic partner choice
Richardson et al. (2014)	Refined Maximization Scale (MS-R)	3	Three distinct factors: wanting the best, experiencing regret in decision making, and decision difficulty
Ma & Roesse (2014)	-----	2	“a tendency to compare and the goal to get the best” (p. 71)
Dalal et al. (2015)	7-Item Maximizing Tendency Scale-7 (MTS-7)	1	Being “unwilling to reduce [one’s] standards when making decisions” (p. 438)
Misuraca et al. (2015)	Decision Making Tendency Inventory (DMTI)	6	Two types of maximizing: resolute maximizing (having high standards and seeking alternatives) and fearful maximizing (experiencing decision difficulty and comparing among alternatives). Also distinguished between less ambitious and more ambitious satisficing and parsimonious and indolent minimizing.

this section, we review the literature on the measurement of maximization, briefly describing the 11 existing measures and attempting to clarify the similarities and differences among them (see Table 1 for a summary). To do so, we focus mainly on the definitions guiding the development and interpretation of the maximization scales, paying partic-

ular attention to questions of face validity.

In our view, a significant limitation of the maximization measurement literature is that researchers have tended to draw conclusions from empirical results, particularly psychometric analyses, while neglecting or underweighting the theoretical conceptualization of maximization that should,

we believe, be the most important element in determining how to measure maximization. Psychometric analyses such as factor analysis are “a means to an end, the end being the development of scales that further our understanding of the construct they measure” (Briggs & Cheek, 1986, p. 112). Previous research on the measurement of maximization has perhaps risked using psychometric analyses as an end rather than a means, with too little regard for construct validity and maximization theory. As a result, we are confident that many of the existing scales have adequate psychometric properties. We are more concerned with their validity.

### 3.1 Maximization Scale (MS)

As mentioned earlier, Schwartz et al. (2002) developed the Maximization Scale (MS) to measure individual differences in the tendency to maximize. They based their conceptualization of maximization on Simon’s (1955, 1956, 1957) theory of bounded rationality, in which he defined maximization as both a goal and a strategy. According to Simon, the goal of maximization is to make the best choice, which is achieved by searching exhaustively through alternatives. Although Simon may not have explicitly distinguished between the goal of choosing the best option and the strategy used to achieve it, he did emphasize the importance of understanding “decisional processes” (Simon, 1955, p. 100) and distinguished between the “economic man” (i.e., the maximizer), who continues to seek out additional superior alternatives even after encountering a high quality option, and the (in his view more realistic) individual, who, as a satisficer, stops searching for alternatives after encountering one that is good enough to meet his standards. Thus, Simon at least implicitly differentiated between choice goals and choice processes or strategies.

Drawing on Simon’s theory, Schwartz et al. (2002) argued that maximizers seek to make optimal choices, whereas satisficers seek only to make choices that are good enough to meet their standards. To distinguish between maximizers and satisficers, the authors designed items for the MS intended to reflect the tendency to seek the best (the items of the MS and all other maximization measures are presented in the Appendix). Some of these items related to having very high standards (e.g., “I never settle for second best”), some related to strategies used to find the optimal choice (e.g., “When I watch TV, I channel surf, often scanning through the available options even while attempting to watch one program”), and others reflected difficulty or stress in the decision making process (e.g., “I often find it difficult to shop for a friend”).

To examine the factor structure of the 13-item MS, Schwartz et al. (2002) conducted a principle component analysis, which yielded three factors for the MS, as well as a fourth factor consisting of five items designed to measure the tendency to experience regret (which was conceptual-

ized as a distinct construct from maximization). These three factors broadly reflected the three groups of items mentioned above; Schwartz et al. explicitly labeled one factor *high standards*, which included items generally related to wanting the best and having high standards for oneself. The second factor included items broadly related to the tendency to search for alternatives and to compare among alternatives in order to find the best choice. The third factor included items related to decision difficulty.

Although factor analysis suggested that the MS was not unidimensional, Schwartz et al. (2002) used only total scores (i.e., the sum of the three factors) in their four studies. Using the 13-item MS, Schwartz et al. found that maximization predicted depression, regret, perfectionism, decreased satisfaction with life, and was also negatively correlated with optimism and happiness. Based on these correlations and the results of their other three studies, Schwartz et al. concluded that maximizers are less happy and more depressed than satisficers. Thus, although maximization may have some benefits (e.g., attaining objectively better outcomes; Iyengar et al., 2006; Polman, 2010), it also appeared to be potentially maladaptive.

### 3.2 Short Form of the Maximization Scale (MS-S)

The reliability of the MS in Schwartz et al.’s (2002) studies was adequate (Cronbach’s  $\alpha = .71$ ), but concerns about the reliability, validity, and factor structure of the scale persisted, particularly due to the initial factor analysis conducted by Schwartz et al. To examine these issues more closely, Nenkov et al. (2008) conducted a series of analyses on data from more than 5,000 participants who had completed the 13-item MS. They replicated the three-factor structure of the MS, naming the three factors *high standards*, *alternative search*, and *decision difficulty*. They also found that a six-item short version, which contained two-item versions of the three factors of the MS, had better psychometric properties than the original 13-item version.

Additional analyses of the new short form of the Maximization Scale (MS-S) revealed the importance of examining each subscale separately, rather than simply summing the three subscales to create one total maximization score. Indeed, the alternative search factor predicted regret and was negatively correlated with satisfaction with life, and the decision difficulty factor also predicted regret and dissatisfaction with life, as well as depression. In contrast, the high standards factor appeared to be more adaptive: it was positively correlated with need for cognition, and, though it was also positively correlated with perfectionism and regret, it was unrelated to depression, happiness, or life satisfaction. Thus, Nenkov et al. (2008) concluded that the maladaptive aspects of maximization may be driven by the tendency to search for and compare among alternatives and to experi-

ence difficulty making decisions, whereas holding high standards may be less negative and even potentially positive. They tempered this conclusion, however, by underlining the need for more research on the definition of maximizing, suggesting that it could be defined as a goal, a strategy, or both. Hence, although they presented the three-factor MS-S, they also acknowledged the possibility that one or more of the three factors might not fit with future conceptualizations of maximization.

### 3.3 Maximizing Tendency Scale (MTS)

Diab, Gillespie, and Highhouse (2008) subsequently criticized the MS for not being unidimensional; they argued that maximization was a unitary construct involving “the general tendency to pursue the identification of the optimal alternative” (p. 365). With this definition in mind, they constructed the Maximizing Tendency Scale (MTS), a new scale designed to be unidimensional. The MTS includes items related to having high standards (e.g., “I never settle”) and the desire to know about and compare as many alternatives as possible (e.g., “I am uncomfortable making decisions before I know all of my options”).

In line with Nenkov et al.’s (2008) finding that having high standards may not be maladaptive, Diab et al. (2008) found that the MTS, which mostly emphasizes having high standards, was positively correlated only with regret and was unrelated to life satisfaction, whereas the MS was positively correlated with neuroticism and indecision, and was negatively correlated with life satisfaction. The authors thus concluded that maximization is a unidimensional construct and that, when defined as the tendency to seek the optimal alternative, it is not necessarily maladaptive.

It is worth noting, however, that, although Diab et al. (2008) claimed to be measuring maximization as one unidimensional construct, their scale actually contains two potentially related but nonetheless distinct tendencies — the tendency to want the best or to have high standards, and the tendency to seek out alternatives. Therefore, the MTS can be seen as including both the high standards and alternative search aspects of maximization as defined by the MS and MS-S, though with a greater emphasis on the former construct. Where the MTS most differs from the MS and MS-S, then, is in its elimination of decision difficulty as a facet of maximization.

### 3.4 Revised Short Form of the Maximization Scale (MS-S-R) and Revised Maximizing Tendency Scale (MTS-R)

In a subsequent study, Weinhardt, Morse, Chimeli and Fisher (2012) further investigated the structure of the MS and the MTS, ultimately deciding, based on item response theory and factor analyses, that both scales were psychome-

trically flawed. In particular, they noted that both scales had questionable reliability and that neither appeared to have a unidimensional structure. With regard to the MS, this conclusion is not surprising; indeed, Nenkov et al. (2008) had already suggested that researchers should separately examine the three subscales of the six-item MS-S instead of summing the 13 items from the MS into a total maximization score. Weinhardt et al. refined the MS into a Revised Short Form of the Maximization Scale (MS-S-R), which, although it did not contain the exact same items as the MS-S, did contain three separate factors that were conceptually identical to the high standards, alternative search, and decision difficulty factors of the MS-S.

In contrast, that Weinhardt et al. (2012) found that the MTS did not appear to be unidimensional is somewhat surprising because it directly clashes with the main goal of Diab et al. (2008) in the design of the MTS. As noted above, however, the original MTS contained items that appeared to reflect both high standards and the tendency to seek alternatives, which may explain why its factor structure diverged from Diab et al.’s goal. Weinhardt et al. created a Revised Maximization Tendency Scale (MTS-R) by removing the three items that were both the most problematic and the most related to the alternative search construct. The MTS-R thus focuses even more specifically than the MTS on having high standards. Weinhardt et al. concluded their analyses with the suggestion that the MTS-R be used for future research, arguing that it best reflected the maximization construct. Hence, Weinhardt et al. narrowed the definition of maximization even more than Diab et al.; whereas the latter’s definition includes some tendency to desire and seek out alternatives in addition to having high standards, the former’s definition focuses exclusively having high standards.

### 3.5 7-Item Maximizing Tendency Scale (MTS-7)

In response to questions about the content and reliability of the MTS, Dalal, Diab, Zhu and Hwang (2015) re-examined the psychometric properties of the MTS. Based on the results of factor and item response theory analyses, Dalal et al. removed two of the items from the MTS to create the 7-Item Maximizing Tendency Scale (MTS-7). The two removed items, which were two of the three items that Weinhardt et al. (2012) had also removed to create the MTS-R, are the two that most reflect the alternative search construct. Accordingly, like the MTS-R, the MTS-7 narrows the definition of maximization to solely include having high standards. Note that the MTS-R and MTS-7 are therefore nearly identical; the only difference is that the MTS-7 contains the additional item “No matter what it takes, I always try to choose the best thing,” which fits with the goal of choosing the optimal outcome typically included in the high standards construct.

### 3.6 Modified Maximizing Scale (MMS)

A similar approach to that of Diab et al. (2008) was taken by Lai (2010), who developed a Modified Maximizing Scale (MMS) intended to measure maximizing without decision difficulty. As a result, her scale showed similar patterns of correlations as the MTS: it was positively correlated with regret, need for cognition, and optimism, and was unrelated to an item intended to measure decision difficulty. Thus, Lai, like Diab et al., concluded that the definition of maximization involved the pursuit of the best alternative but not decision difficulty, and that maximizing may therefore not carry all of the negative implications suggested by Schwartz et al. (2002).

### 3.7 Maximization Inventory (MI)

In another series of studies on maximizing, Rim, Turner, Betz and Nygren (2011) and Turner, Rim, Betz and Nygren (2012) took a quite different approach to the conceptualization and measurement of maximization. Based on factor analyses and item response theory analyses, Rim et al. drew two central conclusions. First, they concluded that both the MS and the MTS had serious psychometric weaknesses. Second, they argued that high standards should not be included in the definition of maximization; rather, alternative search and decision difficulty together comprise maximization. This latter argument arose from analyses that showed that both the MTS (which emphasizes high standards) and the high standards subscale of the MS were not only weakly related to the decision difficulty and alternative search dimensions of the MS, but also showed a very different — and, in line with the findings of Diab et al. (2008) and Lai (2010), more adaptive — pattern of correlations than the alternative search and decision difficulty factors. Because the tendency to have high standards appears to be positively related to well-being while alternative search and decision difficulty are negatively related to well-being, Rim et al. suggested that high standards cannot be a component of maximization.

Building on Rim et al. (2011), Turner et al. (2012) constructed the Maximization Inventory (MI), an entirely new measure that includes three distinct factors that are not summed to create a total score. Two of these factors are *alternative search* and *decision difficulty*, which conceptually mirror the two factors of the same name in the MS-S. The third dimension of the MI is *satisficing*, which Turner et al. presented as a unique and previously unstudied element in maximization research. They defined satisficing as an adaptive behavior associated with making choices that meet a person's standards but do not have to be the best. Consistent with their theory, the satisficing scale was positively correlated with happiness, optimism, self-efficacy, and an adaptive decision making style, whereas the decision difficulty

scale was negatively correlated with happiness, optimism, and self-efficacy, and the alternative search scale was unrelated to these measures. Thus, Turner et al. introduced a new definition of maximization that includes the tendency to search for and compare among alternatives and the tendency to experience decision difficulty, but that does not include high standards or an inherent tendency to desire the best (only the second of which potentially distinguishes maximizers, as satisficers can also have quite high standards). Furthermore, by defining satisficing as a new and distinct construct, the authors explicitly rejected the conceptualization of maximizing and satisficing as two ends of the same continuum.

It is somewhat surprising that Turner et al.'s (2012) definition of maximization excludes the desire for the best, because, at least according to the original theories (e.g., Diab et al., 2008; Schwartz et al., 2002; Simon, 1955, 1956), maximizing is, first and foremost, a tendency to want to get the best outcome or to optimize decision making. Indeed, the very term *maximize* means to make the best of, and thus it is somewhat unclear what maximization as a construct can be if it does not include the goal of optimization or the strategy used to optimize choices. Moreover, Rim et al.'s (2011) and Turner et al.'s exclusion of a high standards component of maximization is largely based on psychometric analyses; they argued that it showed a very distinct pattern of correlations with other measures compared to alternative search and decision difficulty dimensions in addition to being unrelated to the latter two dimensions. However, from a theoretical standpoint, it seems essential to include a desire for the best in any definition of maximization, and it is also possible that the goal of maximization, independent of the strategy of alternative search or the experience of decision difficulty, is not particularly maladaptive. In other words, that the high standards factor of the MS and the total score of the MTS were psychometrically distinct from other factors of maximization need not signal that they do not belong in the study of maximization; rather, it may just be that maximization is a multidimensional construct that can be potentially adaptive or maladaptive (as we argue later).

In addition, it is somewhat unclear whether the MI's satisficing items clearly map onto Turner et al.'s definition of satisficing. Some of the items appear to reflect a "make the best of the situation" approach to decisions (e.g., "Good things happen even when things don't go right at first" and "In life I try to make the most of whatever path I take"), whereas others seem more related to tolerance of uncertainty (e.g., "I accept that life often has uncertainty" and "I can't possibly know everything before making a decision"; see, e.g., Freeston, Rhéaume, Letarte, Dugas & Ladouceur, 1994). Thus, the theoretical conceptualization of satisficing may not necessarily be accurately reflected in the MI's satisficing items.



### 3.8 Refined Maximization Scale (MS-R)

Recently, a series of studies by Richardson, Ye, Ege, Suh and Rice (2014) provided further investigations of the nature and measurement of maximization. Richardson et al. reexamined the original 13-item MS along with the five-item Regret Scale also constructed by Schwartz et al. (2002). Richardson et al. had two primary goals: first, they sought to examine the factor structure of the MS, and second, they aimed to create a measure of maximization that possessed gender invariance, given that previous studies of the MS sometimes showed men scoring higher than women and sometimes showed no gender difference (e.g., Schwartz et al., 2002, Study 1). They conducted a series of exploratory factor analyses on the items from the MS and Regret Scale combined with several new items, which ultimately yielded three factors that they labeled *want the best*, *regret*, and *decision difficulty*. Together, the best items of each of these three factors formed a new 10-item Refined Maximization Scale (MS-R). From a conceptual standpoint, the *want the best* factor largely mirrors the high standards subscale of the MS-S and MS-S-R, the MTS, MTS-R, MTS-7, and the MMS; it is conceptually similar to these previous scales and also shows similar patterns of correlations with other measures (e.g., it is negatively related to depression). The other two factors identified by Richardson et al., however, diverge somewhat from previous research. The regret factor includes items from the Regret Scale and also items previously considered part of the decision difficulty factor of the MS, while the decision difficulty factor is mostly a mix of items from the alternative search and decision difficulty factors of the MS. The authors concluded that the MS-R has superior reliability and validity to the original MS and successfully demonstrates gender invariance.

Although the MS-R might have acceptable reliability, the inclusion of the five Regret Scale items from Schwartz et al. (2002) may not be the most valid way to measure maximization, at least as it has been typically defined. Regret is typically considered to be an *outcome* of maximizing tendencies (e.g., Schwartz, 2004; Schwartz et al., 2002; Zeelenberg & Pieters, 2007) rather than a component comprising the construct of maximization, and fear of regret may also be one *cause* of maximization (e.g., individuals may believe that making the best choice will prevent regret; see, e.g., Schwartz et al., 2002). Hence, combining regret and maximization into one construct impedes research on both the outcomes and the causes of maximization. Richardson et al.'s (2014) definition of maximization as a three-part construct made up of a tendency to experience regret, a desire for the best, and the experience of decision difficulty thus diverges somewhat from previous conceptualizations. That said, the latter two components fit conceptually with the suggestions of Nenkov et al. (2008), though the decision difficulty factor of the MS-R borders on conflating alternative

search and decision difficulty by combining items from both factors in the MS. It is therefore the regret component that most distinguishes Richardson et al.'s view of maximization.

### 3.9 Decision Making Tendency Inventory (DMTI)

Even more recently, Misuraca, Faraci, Gangemi, Carmeci and Miceli (2015) took a new approach to the conceptualization and measurement of maximization. They constructed the Decision Making Tendency Inventory (DMTI) to achieve three goals. First, they sought to reduce the confusion in the maximization literature by designing a new maximization scale. Second, they questioned the construct validity of the satisficing scale of the MI and aimed to create a new, more valid satisficing measure. Third, they introduced a novel construct labeled *minimizing*, which they defined as “the tendency to minimize the amount of resources in order to get the minimum of the possible results... Minimizers settle for mediocrity... and choose the option that meets the absolute minimum” (p. 112). To create the DMTI, Misuraca et al. drew some items from the MS and MTS and also created several new items, and factor analyses yielded a six-factor structure which, according to the authors' interpretation, comprised two maximizing scales, two satisficing scales, and two minimizing scales.

Misuraca et al. (2015) labeled the first maximizing scale *resolute maximizing* and the second maximizing scale *fearful maximizing*. Despite these new names, the two scales map fairly well onto existing constructs in the maximization literature. Specifically, the resolute maximizing scale consists mostly of items reflecting high standards (“I never settle for second best,” “No matter what I do, I always set the highest standards,” and “I never settle”), with one item from the MS reflecting alternative search (“No matter how satisfied I am with my job, it is only right for me to be on the lookout for better opportunities”). On the other hand, the fearful maximizing scale largely mirrors previous decision difficulty scales, and includes decision difficulty items from the MS (e.g., “Renting videos is really difficult. I am always struggling to pick the best one”). The two maximizing scales hence largely reflect high standards and decision difficulty, with the alternative search construct somewhat split between them.

With regard to the two satisficing scales, Misuraca et al. (2015) labeled the first *less ambitious satisficing* and the second *more ambitious satisficing*. The former scale — consisting of items such as “In choosing between alternatives, I stop at the first that works for me” and “When I watch TV or listen to the radio, I tend to follow the first program that I find interesting” — fits well with the definition of satisficing offered by Turner et al. (2012), and may in this respect capture the tendency to make choices that successfully meet personal standards and goals without needing to choose the

best option better than the MI satisficing subscale. The more ambitious satisficing subscale, however, more closely reflects the tendency to make choices that satisfy, as opposed to compromising before an option that meets one's standards has been encountered (e.g., "When I make decisions, I spend the time required to choose an alternative that is satisfactory to me"). A limitation of this scale is that it may not adequately distinguish between maximizers and satisficers, because maximizers and satisficers both continue searching until they find something that meets their goals; it just happens that maximizers are only satisfied with the best. Moreover, even minimizers might endorse the more ambitious satisficing items, because they too do not stop until they find a satisfying result — the difference is that, for minimizers, the satisfying result is any result that minimally suffices. Thus, the more ambitious satisficing subscale may reflect general perseverance more than satisficing *per se*, whereas the less ambitious satisficing subscale may better reflect typical definitions of satisficing.

Finally, Misuraca et al. (2015) distinguished between *parsimonious minimizers*, who seek to spend the least amount of money when making consumer purchases (e.g., "When I buy something, I seek only the cheapest product"), and *indolent minimizers*, who seek to expend as little effort as possible (e.g., "I always set targets to be achieved with minimal effort"). The latter type of minimizing is more related to decision making processes and strategies, and therefore more easily comparable to satisficing and maximizing, whereas parsimonious minimizing is more narrowly focused on spending within a consumer purchasing context. Such a focused tendency is more domain-specific than the majority of previous maximizing scales, and may thus predict a more limited — but not necessarily less important — range of behaviors.<sup>3</sup>

### 3.10 Relational Maximization Scale (RMS)

With the exception of the DMTI, the scales discussed thus far have all approached the measurement of maximization from a domain-general perspective (though some contain items with domain-specific examples of behavior), attempting to assess the general tendency to maximize across many domains. In contrast to this approach, Mikkelsen and Pauley (2013) recently constructed the Relational Maximization Scale (RMS), which is intended to measure maximizing specifically within the domain of romantic relationships. Mikkelsen and Pauley built upon Schwartz et al.'s (2002) original MS to design the RMS with a three-factor structure comprised of relational high standards (e.g., "I won't settle for second best in my romantic relationships"), relational alternative search (e.g., "I constantly compare my current

relationship to other potential relationships"), and relational decision difficulty (e.g., "I have a hard time choosing a relational partner"), and the authors also followed Schwartz et al.'s initial analytic strategy by summing the three factors into one relational maximizing score (rather than examining the three factors separately). Consistent with previous research employing the MS, Mikkelsen and Pauley found that RMS scores predicted lower relationship satisfaction and lower relationship investment. Thus, the RMS applies Schwartz et al.'s definition of maximization to the context of decision making about romantic partners.

### 3.11 Maximizing Mind-Set

One final view of maximization merits review, though its introduction did not coincide with the construction of a new individual difference measure. Ma and Roese (2014) conducted a series of studies in which they attempted to experimentally prime a *maximizing mind-set*, which was "conceptualized in terms of two key features: a tendency to compare and the goal to get the best" (p. 71).<sup>4</sup> This definition essentially mirrors that of Simon (1955), and also fits with the MTS and the MMS designed by Diab et al. (2008) and Lai (2010), respectively. The two features also map more or less onto the alternative search and high standards factors of the MS-S and MS-S-R. Importantly, however, Ma and Roese's definition of maximization does not include decision difficulty, and thus differs from Schwartz et al.'s (2002) original work, though Ma and Roese's findings that inducing a maximizing mind-set increases regret, dissatisfaction, and the likelihood of returning or switching chosen products are largely consistent with the findings of Schwartz et al. and others who included decision difficulty in their conceptualizations of maximization.

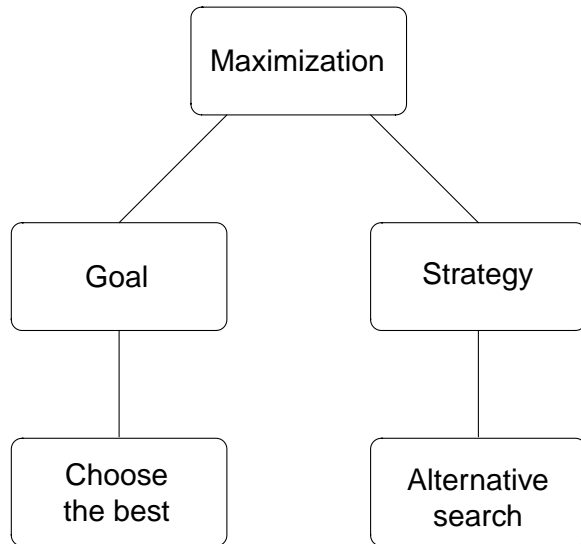
### 3.12 Summary

In sum, several different conceptualizations of maximization as an individual difference have emerged in the years since Schwartz et al.'s (2002) original article. Nenkov et al. (2008) showed that the original MS implicitly conceptualized maximization as the combination of the desire for the best (i.e., "high standards"), the tendency to seek out and compare among alternatives (i.e., "alternative search"), and the tendency to experience difficulty and stress while making decisions (i.e., "decision difficulty"), and created the MS-S, which comprises a high standards subscale, an alternative search subscale, and a decision difficulty subscale. Subsequent researchers designed scales that emphasized high standards and alternative search without decision difficulty (the MTS and the MMS), only high standards (the

<sup>3</sup>As Misuraca et al. (2015) noted, parsimonious minimizers seem quite similar to *tightwads* as defined by Rick, Cryder and Loewenstein (2008), as both try hard to spend as little money as possible.

<sup>4</sup>For another example of the use of this priming procedure, see Mao (2016).

Figure 1: A two-component model of maximization.



MTS-R and MTS-7), or alternative search and decision difficulty without high standards (the MI). Other researchers (Misuraca et al., 2015; Turner et al., 2012) argued that satisficing should be conceptualized as a unique construct, rather than as low scores on maximization scales, and created separate satisficing scales (the MI and DMTI). Furthermore, with the MS-R, Richardson et al. (2014) included regret in their definition and measurement of maximization, and Misuraca et al. (2015) introduced the novel concept of minimizing with their DMTI. Thus, the 11 published measures of maximization offer several different, conflicting conceptualizations of maximization, and at least six separate constructs — high standards, alternative search, decision difficulty, satisficing, regret, and minimizing — have emerged as possible components that make up or are related to maximization.

Despite the many contributions of different authors, a substantial weakness of the extant literature is that much of the theorizing about maximization has followed, rather than preceded, scale development and analysis. As a result, imperfect definitions of maximization — such as maximization without a desire to make the best choice — fit existing scales, but they do not necessarily make theoretical sense, and they clash with Simon’s initial theory. In the next section, we propose a model of maximization that integrates previous empirical and theoretical work in an attempt to begin clarifying the past, present, and future of research on individual differences in maximization.

## 4 A two-component model of maximization

We propose that maximization may be best understood as a two-part construct. Figure 1 presents a two-component

model of maximization, which delineates the two proposed components: the maximization *goal* and the maximization *strategy*. The first component is the maximization goal of choosing the best, which is the goal of optimizing decision making by making the best choice, as highlighted by Simon (1955). With regard to existing theories of maximization, the goal component largely reflects the high standards aspect of maximization included in the MS, MS-S, MTS, MMS, MS-S-R, MTS-R, MTS-7, RMS, and DMTI and the want the best factor of the MS-R. As discussed above, this goal is not included in the MI, nor do Rim et al. (2011) and Turner et al. (2012) believe it should be part of the definition of maximization. Nonetheless, following virtually all other authors, we argue that the goal of choosing the best is an important aspect of maximization; indeed, it may be the more central — almost *definitional* — component.

Although the maximization goal is quite similar to the high standards factor in many scales, there is an important clarification to be made between simply having high standards and actually desiring the *best*. Theoretically, it seems plausible that many people could have high standards without feeling the need to find the absolute best choice — rather, they may simply search until they find an adequate option that meets their standards and then select that option. In fact, they may be happy to choose the first option that fits their criteria, which would, in effect, make them satisficers. Thus, it is not actually having high standards that defines the goal of maximization, but rather desiring the best as opposed to other sub-optimal but still potentially high-quality alternatives.<sup>5</sup>

This distinction is particularly relevant to maximization as conceived by Dalal et al. (2015), who argued that it “is most appropriate. . . to define maximizers as individuals who are unwilling to reduce their standards when making decisions” (p. 438) and that “maximizers differ from satisficers based on having high standards. . . the only thing that distinguishes maximizers from satisficers is the standards they keep” (p. 447). In our view, having high standards need not distinguish satisficers and maximizers — in some cases, they may have identical standards.<sup>6</sup> The desire for the *best* is

<sup>5</sup>More formally, Simon (1956) used the following characteristic to describe a satisficing organism: “If all its needs are met, it simply becomes inactive” (p. 136). Thus, satisficers may have high or low standards, but once their standards are met, they stop searching for additional options. There is no theoretical reason why maximizers must have higher standards than satisficers; it is how they behave when they encounter a sub-optimal option that meets these standards that distinguishes them. Critically, seeking the best uniquely demands an exhaustive search of the options. All other goals, no matter how high the standards, yield searches that stop when the desired standard is met.

<sup>6</sup>For instance, Simon (1955) discusses the example of someone selling a house (pp. 104–105). A satisficer, he argued, determines an *acceptable price*, and then labels “anything over this amount as ‘satisfactory,’ anything less as ‘unsatisfactory’” (p. 104). The acceptance price, however, can be higher or lower depending on the satisficer; i.e., the satisficer could have higher or lower standards for what is an acceptable price. The important point is that the satisficer will accept the *first* acceptable price and

the key distinction: satisficers will stop searching once their standards — however high they may be — are met, whereas maximizers may continue searching for a better option even after they have found one that would potentially meet their standards.<sup>7</sup> Because of the theoretical importance of this distinction, we define the maximization goal as the goal of *choosing the best*, rather than use the misleading label “high standards,” which does not accurately describe an attribute exclusive to maximizers.

The second component of our model is the maximization strategy of *alternative search*, which is the strategy of seeking out alternatives and comparing them. The MS-S, MS-S-R, MI, and RMS include alternative search as a component of maximization, and the MS, MTS, MMS, MS-R, and DMTI also include items that reflect alternative search. Simon’s (1955) original conceptualization of maximization included both a goal and a strategy, and there has been some tendency in previous research to combine the two into a single component of maximization.<sup>8</sup> For instance, the MTS includes items that reflect the goal of maximization and others that reflect the desire to know about alternatives (see Weinhardt, et al., 2012), and thus a two-component model helps distinguish between these two related, but nonetheless distinct facets of maximization.

Our definition of the maximization strategy combines the process of seeking out alternatives, including the act of seeking out information about alternatives, with the process of comparing alternatives. The process of seeking out alternatives may be more relevant in situations with many options; with only a few options, the processes of seeking out more information about the available options and extensively comparing among them may be more relevant. For instance, a maximizer may identify all possible options quickly, but then spend a large amount of time trying to evaluate the tradeoffs of the choice alternatives. A satisficer,

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stop considering additional offers. Expanding on Simon’s argument, we suggest that a maximizer, in contrast, will continue considering alternative offers with the goal of finding the best offer even after receiving an offer above the acceptable price. Indeed, the maximizer may not even have an “acceptable price.” Instead, the highest price becomes the acceptable price. And a satisficer could have higher standards than a maximizer. Suppose the satisficer wants to get at least \$500,000 for the house whereas the maximizer wants the highest (i.e., best) offer. The best offer that comes in is for \$475,000. The maximizer sells the house and the satisficer takes it off the market.

<sup>7</sup>Of course, it may often be impossible for maximizers to identify, much less choose, the best option (indeed, this was one of Simon’s central arguments), but we emphasize that they have the goal of choosing the best, even if this is impossible and they eventually choose a sub-optimal alternative. Indeed, it is this impossibility that may make maximizing so potentially detrimental to well-being (Schwartz, 2000, 2004, 2010; Schwartz et al., 2002).

<sup>8</sup>In theorizing about satisficing, Simon (1956) distinguished between “goals” and “means” (see, e.g., pp. 130–131), which highlights the importance of conceptualizing the maximization goal and the maximization strategy as separate components of maximization. The maximization strategy of alternative search can be seen as the “means” by which maximizers seek to achieve the maximization goal of choosing the best option.

on the other hand, would stop considering tradeoffs once a suitable option has been identified. Thus, in our view, the maximization strategy extends beyond the act of seeking out alternatives to include comparison and information-seeking processes as well. Future research, however, may benefit from further distinguishing between these different facets of the maximization strategy.

Drawing from research on goals and strategies as mid-level personality constructs (for a recent review, see Norem, 2012), we emphasize that to be a maximizer, an individual must pursue the *goal* of choosing the best through the *strategy* of alternative search, as opposed to through the use of other strategies. For example, although the desire to make the best choice often leads to extensive comparison among alternatives (e.g., Swan, 1969), an individual pursuing the maximization goal could instead consult online reviews of products by other consumers (e.g., Smith, Menon & Sivakumar, 2005), simply choose the highest rated product in *Consumer Reports*, or even think about other things while waiting for the best choice to reveal itself (e.g., Giblin, Morewedge & Norton, 2013). In each of these cases, this individual would *not* be a maximizer, because maximization is the combination of the desire for the best option and the strategy of seeking out and comparing alternatives. The two-component model’s differentiation between the maximization goal and the maximization strategy thus follows from the larger literature on personality and motivation that highlights the importance of both personal goals and cognitive-behavioral strategies adopted to achieve goals as separate but potentially related constructs (e.g., Cantor, 1990; Emons, 1986; Klinger & Cox, 2004; Little, 2015; Norem, 1989). Although Schwartz et al. (2002) did not articulate the maximization goal and strategy in these terms, their scale did include items reflecting both a goal and a strategy; in other words, the combination of the goal and strategy components of maximization was implicitly included in their initial conceptualization of maximization (though they also included items reflecting decision difficulty in their scale).

With regard to the strategy component of our model, it is worth noting that Dalal et al. (2015) explicitly excluded the alternative search strategy from their conceptualization of maximization (for a related argument, see also Weinhardt, et al., 2012). They argued that alternative search, as defined and measured by Nenkov et al.’s (2008) MS-S, actually reflects a rational decision making style, as measured by the rational decision making subscale of Scott and Bruce’s (1995) General Decision-Making Style (GDMS) measure. Despite this argument, Dalal et al.’s hypothesis that the alternative search subscale of the MS-S would be more related to a rational decision making style than other measures of maximization was not supported by the results of their study. However, this null result may be explained by the fact that, although Scott and Bruce defined a rational decision making style as “a thorough search for and logical evaluation of

alternatives” (p. 820), the items of the rational decision making style subscale seem to more closely reflect a tendency to think carefully and deliberately about decisions than a tendency to search for and compare among alternatives (e.g., “I double-check my information sources to be sure I have the right facts before making decisions”; “My decision making requires careful thought”; “I make decisions in a logical and systematic way”).<sup>9</sup> Thus, it may be true that the alternative search subscale of the MS-S reflects Scott and Bruce’s definition of a rational decision making style; it may just be that the rational decision making style subscale of the GDMS mostly measures careful thinking and deliberative processing of information during decision making, rather than any specific mode of alternative search.

Importantly, however, Scott and Bruce’s (1995) conceptualization of rational decision making as the tendency to seek out and compare alternatives derives from the same theoretical source as Simon’s (1955, 1956, 1957) work on satisficing — namely, rational choice theory. That is, the alternative search strategy *is* what would be considered “rational” according to traditional economic theorizing. Accordingly, Dalal et al.’s (2015) apparent re-definition of the alternative search construct does not actually clash with Simon’s definition of maximizing; indeed, suggesting that alternative search reflects rational choice theory’s definition of a “rational” choice strategy is actually an argument in favor of including alternative search in the conceptualization of maximization.<sup>10</sup>

An important goal of our model of maximization is to more clearly distinguish between *components* of maximization and *causes* and *outcomes* of maximization. Several existing measures and definitions of maximization include either or both decision difficulty and regret, but both of these are often considered — and, in our view, should be considered — to be consequences or causes, rather than components, of maximization (e.g., Dalal et al., 2015; Lai, 2010;

Rassin, 2007; Schwartz, 2004; Schwartz et al., 2002; Zeelenberg & Pieters, 2007).<sup>11</sup> Since Schwartz et al.’s (2002) initial study, much of the interest in maximization as an individual difference has focused on the potential outcomes of maximization, but including outcomes in the definition of a construct, as maximization scales that measure decision difficulty and regret do, impedes the study of consequences of a construct. A two-component model will therefore facilitate future research by clarifying the distinction between the goal and strategy that together comprise maximization, on one hand, and causes and outcomes of maximization such as regret and decision difficulty, on the other.

## 5 Implications and future directions

### 5.1 Measuring maximization

Having attempted to clarify research on maximization by reviewing previous definitions and measures and proposing an integrative two-component model, we now address the question of how researchers should measure maximization. According to our model, researchers should measure the maximization goal of choosing the best and the maximization strategy of alternative search. In our view, the best measure of the goal of choosing the best is Dalal et al.’s (2015) MTS-7, which follows Diab et al.’s (2008) MTS in its emphasis on the desire to make the best choice, but also refines the MTS by eliminating two items that reflect alternative search more than the goal of choosing the best. The MTS-7 is also preferable to the high standards subscale of Nenkov et al.’s (2008) MS-S because the MTS-7 has more items and thus superior psychometric properties.

Of the existing measures, the two that most specifically seek to measure the maximization strategy are the alternative search subscale of the MS-S and the alternative search scale of Turner et al.’s (2012) MI. The alternative search subscale of the MS-S is only two-items long and contains at least one potentially outdated item (“When I am in the car listening to the radio, I often check out other stations to see if something better is playing, even if I am relatively satisfied with what I’m listening to”). In contrast, the alternative search scale of the MI is longer, but may not as closely reflect the maximization strategy, as some of its items appear related to other behaviors beyond alternative search (e.g., “When I see something that I want, I always try to find the

<sup>9</sup>Scott and Bruce’s (1995) definition of rational decision making also appears to relate to the reasoning and decision making style of actively open-minded thinking (see, e.g., Baron, 1993, and scale items in Haran, Ritov & Mellers, 2013), which is characterized by the tendency to spend time carefully considering options and alternatives when reasoning or making a decision. Thinking actively and carefully considering additional alternatives can lead to superior outcomes when done in moderation, but searching for too many alternatives may undermine decision making. An interesting direction for future research may be to consider how maximizers’ tendency to seek out as many alternatives as possible represents an instance of having “too much of a good thing” (e.g., Grant & Schwartz, 2011). Whereas some alternative search is helpful in decision making, extensive alternative search may undermine decision making rather than improving it further.

<sup>10</sup>Implicit in Dalal et al.’s (2015) argument seems to be the assumption that because a choice strategy is labeled “rational”, it cannot be part of maximization. Yet, Simon’s arguments focused on critiquing the view of maximization as the supposedly “rational” approach to decision making. And since Simon’s critique, modern researchers have continued to debate and reconsider the supposed rationality of the maximization strategy and other facets of rational choice theory (see, e.g., Baron, 1985; Byron, 2004; Schwartz, Ben-Haim & Dacso, 2011). Whether or not a behavior is “rational” should not determine what constitutes maximization.

<sup>11</sup>One possible reason why previous researchers have included decision difficulty in their conceptualizations of maximization is that Simon argued that decision difficulty would be a logical outcome of attempting to maximize utility with limited time and finite cognitive resources. Simon did not consider individual differences; therefore, individual variation in decision difficulty does not necessarily fit with a strict interpretation of his arguments. However, in our view, failing to distinguish between maximization and decision difficulty undermines research on moderators of the effects of maximization and ignores the fact that, theoretically, there are some situations in which maximization need not cause any decision difficulty.

best deal before purchasing it”; “I usually continue to search for an item until it reaches my expectations”; I just won’t make a decision until I am comfortable with the process”). Thus, for now, we tentatively recommend the use of the alternative search subscale of the MI, though we also encourage future researchers to continue to consider and refine the measurement of the maximization strategy.

An open question for maximization research concerns the conceptualization of satisficing. Although some authors have cautioned against assuming that satisficing and maximizing are two ends of the same continuum, much of previous research nonetheless defines satisficing as the opposite of maximizing — or, more specifically, as low scores on maximization scales (e.g., Schwartz et al., 2002; Diab et al., 2008). Turner et al. (2012) broke from this pattern by including a satisficing scale in their MI, which they argued was a separate construct. As mentioned above, however, some of the MI’s satisficing items seem more related to tolerance for uncertainty and a “make the best of the situation” approach to decisions. Furthermore, researchers have questioned its incremental validity (Moyano-Díaz, Martínez-Molina, & Ponce, 2014) and reliability (Dewberry, Juanchich & Narendran, 2013).

Following Turner et al. (2012), Misuraca et al. (2015) similarly conceptualized satisficing as a separate construct from maximizing, and further distinguished between less ambitious satisficing and more ambitious satisficing. Although the DMTI’s more ambitious satisficing scale appears to reflect a tendency to persevere more than a tendency to satisfice, the less ambitious satisficing scale does appear to fit well with a definition of satisficing as the tendency to choose the first option that meets one’s criteria when making a choice. Thus, the DMTI’s less ambitious satisficing scale may be the most appropriate satisficing scale for future research, though more research may be needed to further develop the concept of satisficing (e.g., Moyano-Díaz et al., 2014).

## 5.2 Situational and personality moderators

An important direction for future research is to investigate moderators of maximization’s consequences — both within and outside the individual chooser — in addition to simply looking at the main effects of maximization on decision satisfaction and well-being. (For a similar argument with regard to decision making research in general, see Appelt, Milch, Handgraaf & Weber, 2011.) Indeed, previous research has highlighted contextual factors such as the reversibility of choices (Shiner, 2015) or the number of options in a choice set (e.g., Dar-Nimrod et al., 2009), as well as individual differences such as consumer product knowledge (Karimi, Papamichail & Holland, 2015), as important potential moderators of the influence of maximization on post-decision satisfaction, yet the majority of existing stud-

ies compare maximizers and satisficers without considering additional factors. Thus, considering how other individual differences (e.g., decision making competence; Bruine de Bruin et al., 2007) and contextual factors interact with the maximization goal and strategy should be an important objective for future research.

One possible approach to the study of moderators of maximization is to study the moderating role of maximization ability — that is, the feasibility of actually finding the optimal option when making a choice, which may depend on both individual differences such as decision competence and working memory capacity and situational variables such as choice set size and time pressure. Including maximization ability as a moderator may, for instance, help further clarify the relation between maximization and decision difficulty. As noted above, several authors included decision difficulty as a factor in their measures of maximization (Nenkov et al., 2008; Schwartz et al., 2002; Richardson et al., 2014; Turner et al., 2012), whereas others have argued that the construct of maximization does not inherently include the tendency to find decisions difficult or stressful (Dalal et al., 2015; Diab et al., 2008; Lai, 2010; Weinhardt et al., 2012). We agree that decision difficulty is an outcome of maximization, and considering maximization ability helps resolve the existing disagreement about decision difficulty, because it balances the theoretical and practical experience of maximizers.

Specifically, in line with the arguments of Dalal et al. (2015), Diab et al. (2008), Lai (2010), and Weinhardt et al. (2012), it is theoretically true that, at least in a perfect world, maximizers do not necessarily need to experience decision difficulty. In a hypothetical choice situation involving the consideration of three options, two of which are clearly suboptimal across all dimensions and the third of which is therefore clearly the best across all dimensions (i.e., dominant), a maximizer’s choice would likely be quite simple and involve little, if any, decision difficulty (see also Ma & Roese, 2014). Accordingly, it is not justifiable to include the experience of decision difficulty in our model of maximization.

However, the real world, at least for the average American consumer, is one of consumer freedom and choice overload, in which it is likely incredibly difficult — if not outright impossible — to find the best option (e.g., Broniarczyk & Griffin, 2014; Schwartz, 2004; Schwartz et al., 2002). Indeed, in many cases, the proliferation of choices may make the cost of finding the best too high, such that consumers do not have the time or other resources to identify the best option (Schwartz, 2004; see also Simon, 1955, 1956). Thus, it is likely that, in line with the arguments of Schwartz et al. (2002), Nenkov et al. (2008), Rim et al. (2011), Turner et al. (2012), and Richardson et al. (2014), maximizers do tend to experience greater levels of decision difficulty, such that, in practice, decision difficulty often seems endemic to maximization. Studying maximization ability thus integrates the theoretical and the practical because it facilitates the consid-

eration of maximizers' decision experience when they make choices in the real world among thousands of possible options.

Distinguishing between components, outcomes, and moderators of outcomes of maximization may also help shed light on previous conflicting conclusions about the potentially negative effects of maximization for satisfaction and well-being. As mentioned earlier, one consistent finding is that measures that focus on the maximization goal (i.e., the "high standards" component of maximization; e.g., the MTS and the high standards subscale of the MS-S) do not appear to predict unhappiness, dissatisfaction with life, or depression. It may thus be that when considered independent of the maximization strategy and other moderators such as maximization ability, the maximization goal is not detrimental to well-being. Moreover, high self-esteem and optimism may increase the desire for the best, because people who see themselves as successful may also see themselves as deserving of the best.

When maximization strategy and ability enter into the picture, however, the implications for maximization may become more negative. Previous research has highlighted that the tendency to seek out and compare alternatives often predicts lower life satisfaction (e.g., Nenkov et al., 2008), perhaps because of how comparison underlines negative attributes of choice options (e.g., Brenner, Rottenstreich & Sood, 1999), and this relationship may be stronger in some situations than in others, or stronger for some people (e.g., unhappy people; Schwartz et al., 2002) than for others. As the number of options increase, for instance, the alternative search strategy likely becomes more detrimental to well-being. In fact, a mathematical time allocation model recently developed by Álvarez, Rey and Sanchis (2014; see also Álvarez, Rey & Sanchis, 2016) posits exactly that relationship: for small choice sets, searching through all alternatives in an attempt to find the best may be the optimal choice strategy, but as the size of the choice set increases, the maximization strategy undermines well-being and satisficing becomes a more adaptive approach to decision making (see also Dar-Nimrod et al., 2009).

Thus, although the maximization strategy may be related to unhappiness, we predict that moderators like the ability to maximize should be most predictive of well-being. Experiencing more difficulty in achieving optimization should lead to more unhappiness, depression, and dissatisfaction than comparing among alternatives and ultimately succeeding in finding the best option. Having the goal of maximization and following the maximization strategy but lacking the ability to maximize successfully may therefore be the ultimate recipe for unhappiness. In summary, then, taking a person  $\times$  situation approach to the study of maximization will help answer pressing questions about when and why maximizers are less happy, in addition to adding important nuance to the study of individual differences in decision mak-

ing goals and strategies (Appelt et al., 2011; Norem, 2012).

### 5.3 Domain-specific maximization

As researchers attend more to the role of situations in maximization research, it will also be important for future investigations to further explore the implications of maximization within specific domains. With the exception of Mikkelsen and Pauley's (2013) RMS, maximization scales have been designed to measure domain-general maximization under the assumption that maximizers will maximize in most, if not all, contexts. Although it is likely that maximizers do maximize in more contexts than satisficers (Schwartz et al., 2002; see also Fleeson, 2001), future research may also benefit from considering domain-specific instances of maximization, perhaps because domain-specific scales better predict domain-specific maximization, because some maximizers' behavior is more domain-specific than previously predicted, or because people are generally more likely to maximize in some domains than in others (e.g., Carter & Gilovich, 2010).

Two choice domains that have received particular attention in maximization research are career decision making (e.g., Iyengar et al., 2006; Leach & Patall, 2013; Paivandy et al., 2008; van Vianen, De Pater & Preenan, 2009) and romantic relationship choice (e.g., Long & Campbell, 2015; Mikkelsen & Pauley, 2013; Yang & Chiou, 2010). Hence, career- and relationship-specific measures of maximization may be particularly useful for future research, though we note that the RMS does not necessarily fit well with our two-component model of maximization. Accordingly, researchers might consider developing domain-specific measures of maximization that more closely reflect the maximization goal and strategy outlined in this paper.

### 5.4 The role of culture

Finally, more work must be done to determine how maximization functions across different cultures, as this is an issue for both scale construction and scale interpretation. Some preliminary research suggests that the relations between maximization and well-being differ across cultures (Datu, in press; Faure, Joulain & Osurak, 2015; Moyano-Díaz et al., 2013; Oishi, Tsutsui, Eggleston & Galinha, 2014; Roets, Schwartz & Guan, 2012). On the other hand, researchers have drawn conclusions about the general, potentially universal, measurement and consequences of maximization from research in at least four different societies: the U.S. (e.g., Diab et al., 2008; Schwartz et al., 2002; Turner et al., 2012), Norway (Lai, 2010), Chile (Moyano-Díaz et al., 2014), and Italy (Misuraca et al., 2015). Thus, we regard the matter as unresolved and in need of further empirical and theoretical attention. Researchers should take care to attend to the possible implications of cultural differ-

ences for maximization; indeed, it is possible that our two-component model will not generalize across all cultures.

## 6 Conclusion

In an attempt to clarify the contradictory literature on the meaning and measurement of maximization, we reviewed the 11 published maximization measures, striving to highlight similarities and differences among different researchers' conceptualizations of maximization. We then introduced a two-component model of maximization that posits that maximization can be understood as the pursuit of the maximization goal of choosing the best option through the maximization strategy of alternative search. Our aim throughout was to clarify concepts, in the belief that conceptual clarity is essential if we are to ascertain both how to interpret existing data and what new data need collecting in the future. We hope that this review has helped create a clearer path for future research, and that we are now one step closer to maximizing the study of maximization.

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## Appendix: Maximization scales

### Maximization Scale (MS, Schwartz et al., 2002)

1. When I watch TV, I channel surf, often scanning through the available options even while attempting to watch one program.
2. When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I'm relatively satisfied with what I'm listening to.
3. I treat relationships like clothing: I expect to try a lot on before I get to the perfect fit.
4. No matter how satisfied I am with my job, it's only right for me to be on the lookout for better opportunities.
5. I often fantasize about living in ways that are quite different from my actual life.
6. I'm a big fan of lists that attempt to rank things (the best movies, the best singers, the best athletes, the best novels, etc.).
7. I often find it difficult to shop for a gift for a friend.
8. When shopping, I have a hard time finding clothing that I really love.
9. Renting videos is really difficult. I'm always struggling to pick the best one.
10. I find that writing is very difficult, even if it's just writing a letter to a friend, because it's so hard to word things just right. I often do several drafts of even simple things.
11. No matter what I do, I have the highest standards for myself.
12. I never settle for second best.
13. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment.

### Short Form Maximization Scale (MS-S, Nenkov et al., 2008)

#### High Standards Subscale

1. No matter what I do, I have the highest standards for myself.
2. I never settle for second best.

#### Alternative Search Subscale

1. When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I am relatively satisfied with what I'm listening to.
2. No matter how satisfied I am with my job, it's only right for me to be on the lookout for better opportunities.

**Decision Difficulty Subscale**

1. I often find it difficult to shop for a gift for a friend.
2. Renting videos is really difficult. I'm always struggling to pick the best one.

**Maximizing Tendency Scale (MTS, Diab et al., 2008)**

1. No matter what it takes, I always try to choose the best thing.
2. I don't like having to settle for "good enough."
3. I am a maximizer.
4. No matter what I do, I have the highest standards for myself.
5. I will wait for the best option, no matter how long it takes.
6. I never settle for second best.
7. I am uncomfortable making decisions before I know all of my options.
8. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment.
9. I never settle.

**Modified Maximization Scale (MMS, Lai, 2010)**

1. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment.
2. My decisions are well thought through.
3. I am uncomfortable making decisions before I know all of my options.
4. Before making a choice, I consider many alternatives thoroughly.
5. No matter what I do, I have the highest standards for myself.

**Revised Short Form Maximization Scale (MS-S-R, Weinhardt et al., 2012)****High Standards Subscale**

1. No matter what I do, I have the highest standards for myself.
2. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the time.

**Alternative Search Subscale**

1. When I watch TV, I channel surf, often scanning through the available options even while attempting to watch one program.
2. When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I am relatively satisfied with what I am listening to.

**Decision Difficulty Subscale**

1. I often find it difficult to shop for a gift for a friend.
2. When shopping, I have a hard time finding clothing that I really love.
3. Renting videos is really difficult. I'm always struggling to pick the best one.
4. I find that writing is very difficult, even if it's just writing a letter to a friend, because it's so hard to word things just right. I often do several drafts of even simple things.

**Revised Maximizing Tendency Scale (MTS-R, Weinhardt et al., 2012)**

1. I don't like having to settle for good enough.
2. I am a maximizer.
3. No matter what I do, I have the highest standards for myself.
4. I will wait for the best option, no matter how long it takes.
5. I never settle for second best.
6. I never settle.

**7-Item Maximizing Tendency Scale (MTS-7, Dalal et al., 2015)**

1. I don't like having to settle for good enough.
2. I am a maximizer.
3. No matter what I do, I have the highest standards for myself.
4. I will wait for the best option, no matter how long it takes.
5. I never settle for second best.
6. I never settle.
7. No matter what it takes, I always try to choose the best thing.

**Maximization Inventory (MI, Turner et al., 2012)****Alternative Search Scale**

1. I can't come to a decision unless I have carefully considered all of my options.

2. I take time to read the whole menu when dining out.
3. I will usually continue shopping for an item until it reaches all of my criteria.
4. I usually continue to search for an item until it reaches my expectations.
5. When shopping, I plan on spending a lot of time looking for something.
6. When shopping, if I can't find exactly what I'm looking for, I will continue to search for it.
7. I find myself going to many different stores before finding the thing I want.
8. When shopping for something, I don't mind spending several hours looking for it.
9. I take the time to consider all alternatives before making a decision.
10. When I see something I want, I always try to find the best deal before purchasing it.
11. If a store doesn't have exactly what I'm shopping for, then I will go somewhere else.
12. I just won't make a decision until I am comfortable with the process.

#### Decision Difficulty Scale

1. I usually have a hard time making even simple decisions.
2. I am usually worried about making a wrong decision.
3. I often wonder why decisions can't be more easy.
4. I often put off making a difficult decision until a deadline.
5. I often experience buyer's remorse.
6. I often think about changing my mind after I have already made my decision.
7. The hardest part of making a decision is knowing that I will have to leave the item I didn't choose behind.
8. I often change my mind several times before making a decision.
9. It's hard for me to choose between two good alternatives.
10. Sometimes I procrastinate in deciding even if I have a good idea of what decision I will make.
11. I find myself often faced with difficult decisions.
12. I do not agonize over decisions. (R)

#### Satisficing Scale

1. I usually try to find a couple of good options and then choose between them.
2. At some point you need to make a decision about things.
3. In life I try to make the most of whatever path I take.
4. There are usually several good options in a decision situation.

5. I try to gain plenty of information before I make a decision, but then I go ahead and make it.
6. Good things can happen even when things don't go right at first.
7. I can't possibly know everything before making a decision.
8. All decisions have pros and cons.
9. I know that if I make a mistake in a decision that I can go "back to the drawing board."
10. I accept that life often has uncertainty.

#### Relational Maximization Scale (RMS, Mikkelsen & Pauley, 2013)

1. I constantly compare my current relationship to other potential relationships.
2. No matter how satisfied I am in my current relationship, I am always on the lookout for a better relationship.
3. I wonder if I would be happier in another relationship.
4. I always like to keep my relational options open.
5. I compare my current relationship to my past relationships to see if my current relationship is better.
6. I won't settle for second best in my romantic relationships.
7. I don't want to settle for a relationship that is "good enough."
8. I know what I want in a relationship and I won't compromise.
9. I believe I can find the best relationship for me and I won't settle.
10. In relationships, I am unwilling to settle for less than I feel I deserve.
11. Finding a relational partner is difficult because I want to choose the perfect person for me.
12. I have a hard time choosing a relational partner.
13. I always struggle to pick the right relational partner.
14. I have a hard time finding a relational partner that I really like.
15. I only commit to a relationship when I know all my expectations are going to be met.
16. I am more selective about my choice of partner than most.

#### Refined Maximization Scale (MS-R, Richardson et al., 2014)

##### Want the Best Factor

1. When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I'm relatively satisfied with what I'm listening to.

2. When I watch TV, I channel surf, often scanning through the available options even while attempting to watch one program.
3. Even if I see a choice I really like, I have a hard time making the decision if I do not have a chance to check out other possible options.

#### **Decision Difficulty Factor**

1. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment.
2. No matter how satisfied I am with my job, it's only right for me to be on the lookout for better opportunities.
3. I always keep my options open so I will not miss the next best choice available in life.

#### **Regret Factor**

1. I often fantasize about living in ways that are quite different from my actual life.
2. Whenever I made a choice, I'm curious about what would have happened if I had chosen differently.
3. Whenever I made a choice, I try to get information about how the other alternatives turned out.
4. When I think about how I'm doing in life, I often assess opportunities I have passed up.

### **Decision Making Tendency Inventory (DMTI, Misuraca et al., 2015)**

#### **Fearful Maximizing Subscale**

1. In all decisions that affect my work or studying, I am always afraid of not choosing the best options.
2. Renting videos is really difficult. I am always struggling to pick the best one.
3. When shopping, I have a hard time finding clothing that I really love.
4. Whenever I am faced with a choice, I try to imagine what all the other possibilities are, even ones that are not present at the moment.
5. When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I am relatively satisfied with what I am listening to.
6. To assure that I get the best deal, I always consult consumer product reviews before buying.

#### **Resolute Maximizing Subscale**

1. In studying or working, I always set the highest targets.
2. No matter what I do, I have the highest standards for myself.
3. I never settle for second best.

4. I never settle.
5. No matter how satisfied I am with my job, it is only right for me to be on the lookout for better opportunities.

#### **Less Ambitious Satisficing Subscale**

1. If I am happy with my work, I do not seek better opportunities.
2. In choosing between alternatives, I stop at the first that works for me.
3. I do not ask for more than what satisfies me.
4. When I watch TV or listen to the radio, I tend to follow the first program that I find interesting.

#### **More Ambitious Satisficing Subscale**

1. In every area, I try to achieve results that are satisfactory for me.
2. In studying or working, I tend to choose solutions that guarantee satisfactory results for me.
3. When I make decisions, I spend the time required to choose an alternative that is satisfactory for me.
4. In studying or working, I spend the time required to choose solutions that meets my needs.

#### **Parsimonious Minimizing Subscale**

1. When I buy clothes, I choose the ones that I really need at the lowest price.
2. When I buy something, I seek only the cheapest products.
3. When I am at the grocery store, I look around to find lower-priced products, even if they are an off-brand.
4. When purchasing any type of product, I do not care about quality. I only care about functionality.
5. I am not willing to waste much time and energy to buy a quality clothing.

#### **Indolent Minimizing Subscale**

1. In studying or working, I set targets to be achieved with minimal effort.
2. I always set targets to be achieved with minimal effort.
3. In studying or working, I am okay with any choice that yields the minimum result.
4. In studying or working, even the minimum result may be fine.
5. When I have to make a decision, I choose the option that meets the absolute minimum.